

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 25-28, 31-36 and 38-39 are requested to be cancelled without prejudice or disclaimer.

Claims 30 and 37 are currently being amended to place those claims in independent form, and to address issues raised under 35 U.S.C. § 112, first paragraph, as discussed further below. New claims 40-49 have been added. Claims 40, 42-45 and 47-49 are based on the features of claims 26, 28, 31-32, 34, 36 and 38-39, respectively, which have now been canceled. No new matter has been added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-24, 30, 37 and 40-49 are now pending in this application, of which claims 1-24 are withdrawn from consideration.

Rejections under 35 U.S.C. § 112, first paragraph

Claims 25-28 and 30-39 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is moot with respect to claims 25-28, 31-36 and 38-39, which have been canceled. Claims 30 and 37, have been amended to be in independent form, and also to clarify that the second catalyst layer is disposed on the first catalyst layer. Applicants submit that the rejection under 35 U.S.C. § 112, first paragraph has been overcome.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 25-27 and 33-35 were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over EP 0782880 to Noda et al. ("Noda"). Claims 28 and 36 were rejected under 35 U.S.C. § 103(a) as obvious over Noda in

view of U.S. Patent No. 5,057,483 to Wan (“Wan”). Claims 32 and 39 were rejected under 35 U.S.C. § 103(a) as being obvious over Noda in view of U.S. Patent No. 5,152,231 to Patil et al. (“Patil”). In view of the amendments made herein, all of these grounds of rejection have been rendered moot.

Claims 30, 31, 37 and 38 were rejected under 35 U.S.C. § 103(a) as obvious over Noda. Insofar as this ground of rejection may be applied to the claims as amended, Applicants respectfully traverse for at least the following reasons.

Independent claim 30, as amended, recites as follows:

A catalytic converter comprising:

a carrier; and

a layered structure disposed on the carrier, the layered structure

including:

a hydrocarbon (HC) trap layer trapping HC, said HC trap layer being disposed on the carrier; and

a multilayered catalyst system disposed on the HC trap layer, said multilayered catalyst system comprising *a first catalyst layer disposed on the HC trap layer and a second catalyst layer disposed on the first catalyst layer disposed on the HC trap layer*, the first and second catalyst layers forming a dual-layered catalyst system that is disposed on the HC trap layer such that HC released from the HC trap layer is purified by both the first and second catalyst layers, said first and second catalyst layers comprising catalyst noble metals, respectively, said catalyst noble metal present in the second catalyst layer being controlled to be active earlier than the catalyst noble metal present in the first catalyst layer,

wherein the first catalyst layer comprises a first washcoat, and the second catalyst layer comprises a second washcoat, an amount of said second washcoat present in the second catalyst layer based on a unit volume of the carrier being smaller than an amount of the first washcoat present in the first catalyst layer based on the unit volume of the carrier. (emphasis added).

Thus, in the catalytic converter of claim 30, a first catalyst layer is disposed on the HC trap layer, a second catalyst layer is disposed on the first catalyst layer disposed on the HC trap layer, the first and second catalyst layers comprise first and second washcoats, respectively, and the amount of the second washcoat present (based on a unit volume of the carrier) is smaller than an amount of the first washcoat present (based on the unit volume of the carrier). The references applied fail to either disclose or suggest this feature of claim 30, or appreciate the advantages of such structure.

In contrast to claim 30, Noda indicates in the Examples cited in the Office Action, Examples 14, 16, 17, 20, 83, 88, 93, 98, that the amount of the washcoat present in the outer catalyst layer is larger than the amount of the washcoat present in the inner catalyst layer underlying the outer catalyst layer. For instance, in Example 14, the amount of the washcoat present in the “Third layer” (outer catalyst layer) is 0.09, while the amount of the washcoat present in the “Second layer” (inner catalyst layer) is 0.06. Thus, the relation between the amount of the washcoat present in the outer catalyst layer and the amount of the washcoat present in the inner catalyst layer in the Noda structure is *opposite to that as recited in claim 30*.

Moreover, the relation between the amount of washcoat in the first and second catalyst layers is not obvious in view of the advantages that result therefrom. In particular, due to the amount of the second washcoat present in the second catalyst layer being smaller than the amount of the first washcoat present in the first catalyst layer, the heat capacity of the second catalyst layer (the outer catalyst layer) is reduced. This reduction in heat capacity for the second catalyst layer results in a quick temperature rise at the second catalyst layer during the catalyst activation period. Therefore, when the HC begins to be released from the HC trap layer, the first catalyst layer can be activated earlier so that the released HC can be quickly oxidized and reduced during the engine warm-up operation. Thus, the catalytic converter as recited in claim 30 allows for an increased HC conversion efficiency. Noda does not contemplate increasing the HC conversion efficiency by having the washcoat amount in the outer catalyst be smaller than that in the inner catalyst.

In Noda, the amount of washcoat for the outer catalyst layer is greater than that of the inner catalyst layer, causing the heat capacity of the outer catalyst layer to be larger than that of the inner catalyst layer. This causes a delay in activation of the outer catalyst layer, so that even when the HC release from the HC trap layer is started, the released HC cannot be immediately oxidized. Thus, Noda does not suggest the advantages in increasing the HC conversion efficiency by having the washcoat amount in the outer catalyst be smaller than that in the inner catalyst.

Moreover, not only does Noda effectively teach away from the presently claimed invention, but Noda furthermore does not contemplate or discuss the influence on heat capacity of the outer and inner catalyst layers which is exerted depending on the amounts of the washcoats present in the outer and inner catalyst layers, or the effect on activation of the outer and inner catalyst layers exerted due to the influence of the heat capacity.

With respect to the washcoat feature in claim 30, the Office Action states on page 6:

the specific amount of washcoat in each catalyst layer is not considered to confer patentability to the claim because the specific amount of washcoat in each catalyst layer would have been considered a result effective variable by one having ordinary skill in the art.

Applicants submit, however, that *nowhere does Noda suggest that the amount of washcoat is a result-effective variable*. As discussed above, Noda does not contemplate the effect of the amount of washcoat on the heat capacity of the catalyst layers, nor the resultant effect on catalyst activation and HC conversion efficiency.

Independent claim 37 recites “said multilayered catalyst system comprising a first catalyst layer disposed on the HC trap layer and a second catalyst layer disposed on the first catalyst layer disposed on the HC trap layer” and “wherein the first catalyst layer comprises a first washcoat, and the second catalyst layer comprises a second washcoat, an amount of said second washcoat present in the second catalyst layer based on a unit volume of the carrier being smaller than an amount of the first washcoat present in the first catalyst layer based on the unit volume of the carrier” and is thus patentable for reasons analogous to claim 30.

The dependent claims directly or ultimately depend from either claim 30 or 37 and are therefore allowable for at least the reasons discussed above with respect to the independent claims.

Wan and Patil were cited for other features of the claims, but fail to cure the deficiencies of Noda and analogous arguments apply.

Double Patenting

Claims 25-28 and 30-39 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 6,503,862 in view of EP 918 145 to Ishii et al. ("Ishii") and U.S. Patent No. 4,975,406 to Frestad et al. ("Frestad"). Applicants traverse these rejections for reasons analogous to those provided above. None of the references cited in the double patenting rejection contemplate the relationship between the washcoat amounts in the first and second catalyst layers as recited in claims 30 and 37 in effecting the heat capacity in the context of those claims.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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